PATENT ABSTRACTS OF JAPAN

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(54) DOCUMENT AUTHENTICATION METHODSYSTEMDOCUMENT GENERATORDOCUMENT AUTHENTICATION DEVICE AND RECORDING MEDIUM

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a document authentication method or the like that can properly authenticate a document or the like that is exchanged.
SOLUTION: A document issue side calculates a feature quantity D3 as to document image data D2 acquired by reading a paper document D1pastes a feature quantity image D4 resulting from the feature quantity D3 onto the document image data D2 to generate transmission purpose document image data D5 and prints out a transmission purpose paper document D6. A document receiver side separates a feature quantity image D8 from document image data D7 obtained by reading the received paper document D6 to reproduce a feature quantity (original feature quantity) D9. Furthermorethe document receiver side calculates a feature quantity D11 from an original document image D10 from which the feature quantity D8 is separated and compares the feature quantity D11 with the original feature quantity D9 to provide an output of the result of falsification investigation.

CLAIMS

[Claim(s)]
[Claim 1]In [are a document authentication method which attests documents for transfer which published documents for transfer by the document issuing sideand were received by a documents receiving areaand] said document issuing sideIn [extract a feature section of a documents picturecreate characteristic

information based on this feature sectionstick this characteristic information on said documents pictureoutput a documents picture on which characteristic information was stuck as documents for transferand] said documents receiving areaAbout a picture which receives documents for transfer and starts characteristic information from a picture of these documents for transfer and by which said characteristic information was startedextract a feature sectioncreate characteristic information based on this feature sectionand Said created characteristic informationA document authentication method characterized by what said started characteristic information is compared and the justification of said documents for transfer is checked for.

[Claim 2]In [to said document issuing sideencipher said characteristic information with a document issuing person's secret keystick said enciphered characteristic information on said documents picturedraw up said documents for transferand] said documents receiving areaSaid characteristic information which started enciphered characteristic informationdecrypted said enciphered characteristic information by a document issuing person's public keyand was decrypted from a picture of said documents for transferThe document authentication method according to claim 1 characterized by what characteristic information acquired about a picture by which said enciphered characteristic information was started is compared for.

[Claim 3]In said document issuing side and said documents receiving areaapply predetermined standard coordinates to a documents picture of a processing objectand said characteristic informationInformation about a position of a feature section in said standard coordinatesand the document authentication method according to claim 1 or 2 characterized by a thing of the number of black pixels in said feature section for which at least one of the ** is included comparatively.

[Claim 4]A documents authentication system provided with a document preparing device characterized by comprising the following which draws up documents for transferand a documents authentication device which attests documents for transfer drawn up by said document preparing device.

A means for said document preparing device to extract a feature section of a documents pictureand to create characteristic information based on this feature section.

Stick said characteristic information on said documents picturehave a documents output means which outputs a documents picture on which characteristic information was stuck as documents for transferand said documents authentication deviceA **** means which receives documents for transfer and starts characteristic information from a picture of these documents for transferA checking means which extracts a feature section about a picture by which said characteristic information was startedcompares a preparing means which creates characteristic information based on this feature sectionsaid created characteristic informationand said started characteristic informationand checks the justification of said documents for transfer.

[Claim 5]Said documents output means of said document preparing device enciphers said characteristic information with a document issuing person's secret keyStick said enciphered characteristic information on said documents picturedraw up said documents for transferand said **** means of said documents authentication deviceFrom a picture of said documents for transferby a document issuing person's public keystart enciphered characteristic informationdecrypt said enciphered characteristic informationand said preparing means of said documents authentication deviceAbout a picture by which said enciphered characteristic information was startedextract a feature sectioncreate characteristic information based on this feature sectionand said checking means of said documents authentication deviceThe documents authentication system according to claim 4 characterized by what said said decrypted characteristic information and characteristic information acquired about a picture by which said enciphered characteristic information was started are compared for.

[Claim 6]A document preparing device which draws up documents for transfercomprising:

A means to extract a feature section of a documents picture and to create characteristic information based on this feature section.

A documents output means which outputs a documents picture which stuck said characteristic information on said documents pictureand on which characteristic information was stuck as documents for transfer.

[Claim 7]A documents authentication device which attests documents for transfer generated by sticking characteristic information created based on a feature section of a documents picture characterized by comprising the following on said documents picture.

A **** means which receives documents for transfer and starts characteristic information from a picture of these documents for transfer.

A checking means which extracts a feature section about a picture by which said characteristic information was startedcompares a preparing means which creates characteristic information based on this feature sectionsaid created characteristic informationand said started characteristic informationand checks the justification of said documents for transfer.

[Claim 8]It is the recording medium which recorded a program for operating a computer as a document preparing device which draws up documents for transfer and in which computer reading is possibleA means to extract a feature section of a documents picture for this computerand to create characteristic information based on this feature sectionA recording medium which recorded a program for sticking said characteristic information on said documents pictureconsidering it as a means to output a documents picture on which characteristic information was stuck as documents for transferand making it function and in which computer reading is possible.

[Claim 9]Are a program for making it function as a documents authentication

device which attests documents for transfer generated by sticking characteristic information created in a computer based on a feature section of a documents picture on said documents picture the recorded recording medium in which computer reading is possibleand this computerA means to receive documents for transferto extract a feature section from a picture of these documents for transfer about a means which starts characteristic informationand a picture by which said characteristic information was startedand to create characteristic information based on this feature sectionand said created characteristic informationA recording medium which recorded a program for considering it as a means to compare said started characteristic information and to check the justification of said documents for transferand making it function and in which computer reading is possible.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the document authentication method etc. which can detect the alteration of the documents and document data which are exchanged.
[0002]
[Description of the Prior Art]The documents authentication system for detecting the alteration of the document data transmitted and received is realized. For examplein the system which exchanges document data etc.at the transmitting sidesuch as document dataa digest is created using a hash function about the document data of a transmission objectand document data and a digest are transmitted to a receiving area. In a receiving areathe digest which created and created the digest using the hash function about the received document dataand the received digest are comparedand if in agreementit will be judged that document data is not altered.
[0003]
[Problem(s) to be Solved by the Invention]Howeverit cannot be said that the above documents authentication systems are preferred when exchanging paper as a mediumwithout electronizingtransmitting and receiving documentsfor example (i.e.when documents are published in papera receiving area is passed and the receiving area verifies the justification of documents). It is because there is a possibility that it may arise that it is not in agreement with the digest which silverfishdirtetc. may adhere to documentsand the read picture of these documents changed by this in transfer of the documents through paperand was given to those documents.
[0004]According to the difference etc. of the accuracy of the scanner which the documents issue-side uses when exchanging documents in paperand the scanner which a receiving area uses. A possibility that the documents picture which is an

issue side and is created about the same documentsthe documents picture created by a receiving areaand ** will completely become the same is very lowand distinction of an alteration becomes difficult [a parenchyma top].

[0005]This invention was made in view of the situation mentioned aboveand an object of this invention is to provide the document authentication method etc. which can perform properly attestation of the documents and document data which are exchanged. An object of this invention is to provide the suitable document authentication method for attestation of the documents exchanged in paperetc.

[0006]

[Means for Solving the Problem]In order to attain the above-mentioned purposea document authentication method concerning the 1st viewpoint of this inventionIn [are a document authentication method which attests documents for transfer which published documents for transfer by the document issuing sideand were received by a documents receiving areaand] said document issuing sideIn [extract a feature section of a documents picturecreate characteristic information based on this feature sectionstick this characteristic information on said documents pictureoutput a documents picture on which characteristic information was stuck as documents for transferand] said documents receiving areaAbout a picture which receives documents for transfer and starts characteristic information from a picture of these documents for transfer and by which said characteristic information was startedextract a feature sectioncreate characteristic information based on this feature sectionand Said created characteristic informationSaid started characteristic information is compared and the justification of said documents for transfer is checked.

[0007]According to such compositionby the document issuing sidestick characteristic information createdfor example about a feature section of documentssuch as a character stringon a documents pictureand by a documents receiving area. Existence of an alteration is verifiable about documents exchanged by comparing characteristic information created about a documents picture except characteristic information stuck about a picture of received documentsand stuck characteristic information. When exchanging especially documents in paper by using characteristic information created about a feature section of documentsproper documents can be attested without being influenced by dirt adhering to paperetc.

[0008]In [in said documents receiving areamay encipher said characteristic information with a document issuing person's secret keymay stick said enciphered characteristic information on said documents picturemay draw up said documents for transferand] said document issuing sideEnciphered characteristic information may be started from a picture of said documents for transfersaid enciphered characteristic information may be decrypted by a document issuing person's public keyand said decrypted characteristic information and characteristic information acquired about a picture by which said enciphered characteristic information was started may be compared. Therebyan alteration of a third party who does not have

a document issuing person's secret key can be prevented effectively.

[0009]In said document issuing side and said documents receiving areapredetermined standard coordinates may be applied to a documents picture of a processing objectand said characteristic information may also contain at least one of information about a position of a feature section in said standard coordinatesand the black pixel numbers in said feature section which is ** comparatively. Therebywhen especially transfer documents are paper documentsa proper document can be attestedwithout being influenced by resolution of a scanneretc.

[0010]A documents authentication system concerning the 2nd viewpoint of this inventionAre a document preparing device which draws up documents for transferand a documents authentication device which attests documents for transfer drawn up by said document preparing device a documents authentication system which it hasand said document preparing deviceA means to extract a feature section of a documents picture and to create characteristic information based on this feature sectionStick said characteristic information on said documents picturehave a documents output means which outputs a documents picture on which characteristic information was stuck as documents for transferand said documents authentication deviceA **** means which receives documents for transfer and starts characteristic information from a picture of these documents for transferA feature section is extracted about a picture by which said characteristic information was startedand it has a checking means which compares a preparing means which creates characteristic information based on this feature sectionsaid created characteristic informationand said started characteristic informationand checks the justification of said documents for transfer.

[0011]According to such compositionin a document preparing devicestick characteristic information created about a feature section of documentssuch as a character stringon a documents pictureand with a documents authentication device. Existence of an alteration is verifiable about documents exchanged by comparing characteristic information created about a documents picture except characteristic information stuck about a picture of received documentsand stuck characteristic information. When exchanging especially documents in paper by using characteristic information created about a feature section of documentsproper documents can be attested without being influenced by dirt adhering to paperetc.

[0012]Said documents output means of said document preparing device enciphers said characteristic information with a document issuing person's secret keyMay stick said enciphered characteristic information on said documents picturemay draw up said documents for transferand said **** means of said documents authentication deviceFrom a picture of said documents for transferby a document issuing person's public keymay start enciphered characteristic informationmay decrypt said enciphered characteristic informationand said preparing means of said documents authentication deviceAbout a picture by which said enciphered

characteristic information was startedmay extract a feature sectionmay create characteristic information based on this feature sectionand said checking means of said documents authentication deviceSaid said decrypted characteristic information and characteristic information acquired about a picture by which said enciphered characteristic information was started may be compared. Therebyan alteration of a third party who does not have a document issuing person's secret key can be prevented effectively.

[0013]A document preparing device concerning the 3rd viewpoint of this inventionIt is a document preparing device which draws up documents for transfera feature section of a documents picture is extractedand it has a means to create characteristic information based on this feature sectionand a documents output means which outputs a documents picture which stuck said characteristic information on said documents pictureand on which characteristic information was stuck as documents for transfer.

[0014]A documents authentication device concerning the 4th viewpoint of this inventionIt is a documents authentication device which attests documents for transfer generated by sticking characteristic information created based on a feature section of a documents picture on said documents pictureA **** means which receives documents for transfer and starts characteristic information from a picture of these documents for transferA feature section is extracted about a picture by which said characteristic information was startedand it has a checking means which compares a preparing means which creates characteristic information based on this feature sectionsaid created characteristic informationand said started characteristic informationand checks the justification of said documents for transfer.

[0015]A recording medium concerning the 5th viewpoint of this inventionIt is the recording medium which recorded a program for operating a computer as a document preparing device which draws up documents for transfer and in which computer reading is possibleA feature section of a documents picture is extracted for this computera means to create characteristic information based on this feature sectionand said characteristic information are stuck on said documents pictureand a program for considering it as a means to output a documents picture on which characteristic information was stuck as documents for transferand making it function is recorded.

[0016]A recording medium concerning the 6th viewpoint of this inventionAre a program for making it function as a documents authentication device which attests documents for transfer generated by sticking characteristic information created in a computer based on a feature section of a documents picture on said documents picture the recorded recording medium in which computer reading is possibleand this computerA means to receive documents for transferto extract a feature section from a picture of these documents for transfer about a means which starts characteristic informationand a picture by which said characteristic information was startedand to create characteristic information based on this feature sectionand said created characteristic informationA program for

considering it as a means to compare said started characteristic information and to check the justification of said documents for transferand making it function is recorded.

[0017]

[Embodiment of the Invention]Hereafterthe documents authentication system concerning the embodiment of this invention is explained with reference to drawings. The system configuration figure of the documents authentication system concerning this embodiment is shown in drawing 1. This system is provided with the issuing device 1 which publishes a paper documentand the authentication device 3 which attests the received paper document (document for transfer) so that it may be illustrated.

[0018]The issuing device 1 is provided with the image input part 11the inputted image accumulating part 12the feature calculation part 13the feature accumulating part 14the characteristic quantity imaging part 15the characteristic quantity image storage part 16the outputted image generation part 17and the image output part 18.

[0019]For example including a scannerthe image input part 11 reads the paper document for transferacquires document image dataand saves it at the inputted image accumulating part 12. In accordance with the predetermined calculating method for which the document image data saved at the inputted image accumulating part 12 is mentioned laterthe feature calculation part 13 computes characteristic quantity about each character string in a documentand saves it as characteristic quantity information at the feature accumulating part 14.

[0020]The characteristic quantity imaging part 15 performs a predetermined conversion process to the characteristic quantity information saved at the feature accumulating part 14changes it into a feature quantity imageand is saved at the characteristic quantity image storage part 16. The outputted image generation part 17 generates an outputted image by sticking the feature quantity image saved at the characteristic quantity image storage part 16 to the document image data saved at the inputted image accumulating part 12. The image output part 18 prints the outputted image generated by the outputted image generation part 17 as a paper document.

[0021]The authentication device 3 The image input part 31the inputted image accumulating part 32and the characteristic quantity imaging range specific part 33The characteristic quantity imaging range coordinates accumulating part 34the original image restoration part 35and the original image storage part 36It has the feature calculation part 37the characteristic quantity accumulating part 38the feature quantity image slicing part 39the characteristic quantity image storage part 40the original-feature-quantity regenerating section 41the original-feature-quantity accumulating part 42the difference judgment part 43and the difference decision-output part 44.

[0022]The image input part 31 saves the document image data which read and obtained the paper document published by the issuing device 1 at the inputted image accumulating part 32 including a scanner. The characteristic quantity

imaging range specific part 33 pinpoints the field of a feature quantity imageextracts the coordinate value from the document data saved at the inputted image accumulating part 32and saves it at the characteristic quantity imaging range coordinates accumulating part 34. The original image restoration part 35 creates the picture which made blank the field saved at the characteristic quantity imaging range coordinates accumulating part 34 to the document image data saved at the inputted image accumulating part 32and saves it at the original image storage part 36.

[0023]In accordance with the calculating method same about the document image data saved at the original image storage part 36 as the feature calculation part 13 of the issuing device 1the feature calculation part 37 computes characteristic quantity about each character string in a documentand saves it as characteristic quantity information at the characteristic quantity accumulating part 38. From the document image data saved at the inputted image accumulating part 32the feature image slicing part 39 starts the picture of the coordinates saved at the characteristic quantity imaging range coordinates accumulating part 34and saves it at the characteristic quantity image storage part 40.

[0024]The original-feature-quantity regenerating section 41 reproduces characteristic quantity information from the feature quantity image saved at the characteristic quantity image storage part 40and saves it at the original-feature-quantity accumulating part 42. The difference judgment part 43 compares the characteristic quantity information saved at the characteristic quantity accumulating part 38and the characteristic quantity information saved at the original-feature-quantity accumulating part 42and judges the existence of an alteration of a paper document based on a collated result. The difference decision-output part 44 outputs the decision result by the difference judgment part 43.

[0025]Nextcalculation processing of the characteristic quantity by the feature calculation parts 13 and 37 is explained. Firstthe feature calculation parts 13 and 37 determine the frame f1 which includes all the character strings in the document of a processing object. And an upper left corner point is made into the starting point about the frame f1and the XY plane coordinate system which sets [the coordinates of a top right corner point] the coordinates of (010000)and a lower right corner point to (1000010000) for the coordinates of (100000)and a lower left corner point is set up as standard coordinates.

[0026]Nextthe feature calculation parts 13 and 37 calculate the characteristic quantity (xyhwd1d2d3d4) which consists of eight elements about each character string in a document. The coordinate value (xy) in the standard coordinates of the minimum rectangular upper left corner point where each element of this characteristic quantity surrounds an object character stringthe dip in minimum rectangular standard coordinates and breadth (hw) surrounding an object character stringthe black pixel density (d1d2d3d4) within each divided rectangle at the time of quadrisecting minimum rectangular [surrounding an object character string] into a lengthwise directionand each** et al.-- ******. Among theseit asks

for the black pixel densities d1-d4 using a following formula.

The number of di= black pixels / total pixel number x10000 (i= 1234)

[0027]Thuseven if the read resolution of a scanner changes by normalizing using standard coordinates about characteristic quantitya coordinate value (xy)a dipand breadth (hw) do not change a lot. Influence is made hard to be influenced also about black pixel density (d1d2d3d4)since the number of black pixels also changes according to italthough the pixel number of a reading area changes [change / of the read resolution of a scanner].

[0028]For examplein calculating characteristic quantity about a list as shown in drawing 2The feature calculation parts 13 and 37 determine the frame f1 containing all the character stringsabout the frame f1make an upper left corner point the starting pointand set up the standard coordinates which set [a top right corner point] (010000)and a lower right corner point to (1000010000) for (100000)and a lower left corner point. And characteristic quantity (xyhwd1d2d3d4) is calculatedrespectively about each character string "estimate" in this documentSoutheast Business-affairs Messrs.x, Inc. xxetc.

[0029]For exampleas the character string "Southeast Business-affairs Messrs." is shown in drawing 3 (a)it asks for a coordinate value (810-1380)and the dip and breadth (1450-7800) of an upper left corner point about minimum rectangular [surrounding a character string "Southeast Business-affairs Messrs."]. As shown in drawing 3 (b)it asks for the black pixel density (350281201192) within each rectangle into which it was divided at the time of quadrisecting minimum rectangular [surrounding a character string "Southeast Business-affairs Messrs."] into a lengthwise direction using the above-mentioned formula. And based on each calculated numerical valuethe characteristic quantity (810-13801450780035028120192) of a character string "Southeast Business-affairs Messrs." is calculated.

[0030]Nextthe decision processing of the existence of an alteration of the paper document by the difference judgment part 43 is explained. In this decision processingthe characteristic quantity (the issue side characteristic quantity) acquired from the feature quantity image in a paper document and the characteristic quantity (receiving area characteristic quantity) computed about the document which removed the feature quantity image from the issued document are measuredand it is judged whether that difference is within the limits of predetermined. It is distinguished whether all the 1st2ndand 3rd conditional expression shown belowfor example is specifically filled about the issue side characteristic quantity and receiving area characteristic quantity which were calculated about each character string in a document. And when the 1st – the 3rd conditional expression are filled about the characteristic quantity of all the character stringsit judges with the paper document not being altered.

[0031](1) height h|/(max (height [of the issue side characteristic quantity] hheight [of receiving area characteristic quantity] h)) <[of the height h-receiving area characteristic quantity of the 1st conditional expression | issue side characteristic quantity] alpha (2) -- width w|/(max (the width w of the issue side

characteristic quantity.)) of the width w-receiving area characteristic quantity of the 2nd conditional expression | issue side characteristic quantity About i (i= 1-4) of all the width w<alpha (3) 3rd conditional expression of receiving area characteristic quantityit is black pixel density di|/(max (black pixel density [of the issue side characteristic quantity] diblack pixel density di of receiving area characteristic quantity)) <beta of the black pixel density di-receiving area characteristic quantity of the | issue side characteristic quantity. [0032]alpha and beta which are used by the 1st − the 3rd conditional expression are a parameterand it is desirable to use the proper numerical value acquired by experiment etc. For examplethe issue sidewhen the read resolution of the scanner of a receiving area is the samealpha may use 0.03 and beta may use the numerical value of the 0.04 neighborhoods.

[0033]Nextin this systemit is a document issue-side and a paper document is publishedand with reference to drawing 4it explains flowing into processing until the paper document is carried into a receiving area and receives attestation.

[0034]Firstthe issuing device 1 by the side of issue reads the set paper document D1 with a scanner etc.and generates the document image data D2. Nextthe issuing device 1 computes the characteristic quantity D3 about each character string contained in the generated document image data D2. The issuing device 1 images the computed characteristic quantity D3and generates the feature quantity image D4. Nextthe issuing device 1 sticks the feature quantity image D4 on the document image data D2generates and prints the document image data D5 for transferand draws up the paper document D6 for transfer.

[0035]The paper document D6 published by the issuing device 1 at the issue side is passed to a receiving area. In a receiving areain order to verify the existence of an alteration of the received documenta document is set in the authentication device 3 of a receiving area.

[0036]The authentication device 3 reads the set paper document D6 with a scanner etc.and creates the document image data D7. Nextthe authentication device 3 extracts the feature quantity image D8 from the document image data D7and reproduces the characteristic quantity (original feature quantity) D9 from the feature quantity image D8 further. The authentication device 3 separates the feature quantity image D8 from the document image data D7generates the original document image D10 which made blank the portion of the feature quantity image D8and computes the characteristic quantity D11 about this original document image D10.

[0037]Nextthe authentication device 3 performs comparison processing using the conditional expression mentioned abovefor example about the original feature quantity D9 created from the feature quantity image in it about the paper document received from the issue sideand the characteristic quantity D11 created based on the document image which separated and obtained the feature quantity image D8 from the document image. And when it judges with the measured characteristic quantity being mostly in agreementthe contents of the document passed to the receiving area are outputted as D12 as a result of alteration

verification are not altered. When the difference in the measured characteristic quantity exceeds a prescribed rangeit outputs as D12 as a result of alteration verification of that the contents of the document are altered.

[0038]Thusthe characteristic quantity which is not influenced by the resolution of a scanneretc. is calculated about characterizing portionssuch as a character string in a documentand the paper document which stuck this information on the document is published. And in a receiving areathe characteristic quantity obtained from the stuck information and the characteristic quantity acquired from the document except the information on characteristic quantity are comparedit distinguishes whether these are mostly in agreementand the existence of an alteration is verified. Therebywhen exchanging a paper documenta proper document can be attestedwithout being influenced by the dirt adhering to paperthe difference in the resolution of the scanner of the issue side and a receiving areaetc.

[0039]A bar codea two-dimensional bar codeetc. may be used for a feature quantity image. For exampleit is a case where a feature quantity image is made into a bar codeand in the case of a list as the document for transfer shows to drawing 2since there are ten character strings in a documentten bar codes based on the characteristic quantity of each character string will be stuck as a feature quantity image.

[0040]A third party adding an alteration to original document image data about the paper document published by the issuing device 1generating characteristic quantity based on the document image data after an alterationand generating unjustly the paper document which stuck the feature quantity image based on the characteristic quantity is also considered. For this reasonit may be made to prevent effectively an alteration of the third party who does not have a publisher's secret key using a public-key crypto system by a receiving area the issue side. In the issuing device 1the computed characteristic quantity is enciphered with a publisher's secret keya feature quantity image is generated from the enciphered datait sticks on document image data andspecificallya paper document is generated. On the other handin the authentication device 3the data obtained from the feature quantity image of the received paper document is decrypted by a publisher's public keyoriginal feature quantity is reproducedand comparison processing with the characteristic quantity acquired from the original document image except a feature quantity image is performed.

[0041]This documents authentication system can be applied when it is the versatility for which to verify the justification of a paper document is needed. For examplewhen third partiessuch as an automobile inspection administration buildingattest the resident card which the government office published in paperthe issuing device 1 in a government office publishes a resident card in paper. The characteristic quantity enciphered with the secret key of the government office is attached to this resident card as feature quantity imagessuch as a two dimensions bar code. The residents who received the resident card submit the resident card to an automobile inspection administration buildingfor example at the time of

automobile registration. The authentication device 3 of an automobile inspection administration building reads the set resident cardcompares the characteristic quantity (original feature quantity) which decrypted and obtained the data acquired from the feature quantity image by the public key of the government officeand the characteristic quantity acquired from the original document imageand distinguishes the existence of an alteration. For examplewhen an alteration is added to a document and the feature quantity image is not changedan alteration is detected based on the collated result of the characteristic quantity in the authentication device 3. Since residents do not understand the secret key of a government office even if residents are going to change a feature quantity image at the time of an alterationinjustice will be detected when change is made.

[0042]Also except the above-mentioned procedureresidents can print the document image data which came to hand from the government officefor example via the Internet with the printer of a houseit can bring in an automobile inspection administration buildingand attestation can also be received. Residents may be made to acquire document image data from a government office using a facsimile.

[0043]The documents authentication system concerning this invention is applicable not only to the documents in paper but the electronized document data. In this casethe issuing device 1 is provided with the transmission section which transmits the document image data in which the feature quantity image generated by the outputted image generation part 17 was stuck to the authentication device 3. The authentication device 3 receives the document image data from the issuing device 1and is provided with the receive section which saves at the inputted image accumulating part 32.

[0044]The processing-object documents of the documents authentication system of this invention are not limited to a document. For examplewhen processing-object documents are drawingsthe issuing device 1About each figure on a documentcompute characteristic quantity like the aboveoutput the document etc. which stuck the feature quantity image based on the characteristic quantityand the authentication device 3The characteristic quantity obtained from the feature quantity image in the received document and the characteristic quantity acquired from the picture which removed the feature quantity image from the picture of the document are comparedand the existence of an alteration is distinguished.

[0045]Although characteristic quantity is generated about the character string of a document in the above-mentioned examplerespectivelythis is an example and the unit which generates characteristic quantity is arbitrary. The characteristic quantity in the above-mentioned example is an exampleand what is necessary is to just be influenced by the difference of the picture by the accuracy of a scanner etc.

[0046]In calculation processing of characteristic quantityalthough both the X coordinate values of the top right corner point of the frame f1 and Y coordinate values of a lower left corner point containing all the character strings in a document were set to 10000this is an example and can take arbitrary numerical values. Other formulas may be used also about the formula of the number of black

pixels.

[0047]About the characteristic quantity in the above-mentioned explanationit may be made to use a part of componentand also other elements may be added. The conditional expression used for comparison of the characteristic quantity in the above-mentioned explanation is an exampleand may use other conditional expressionsother judging methodsetc.

[0048]The documents authentication system of this invention cannot be based on a system for exclusive usebut can be realized using the usual computer system. For examplethe issuing device 1 and authentication device 3 grade which perform above-mentioned processing can be constituted by installing this program from the media (a floppy (registered trademark) diskCD-ROMetc.) which stored the program for performing above-mentioned operation in the computer. An above-mentioned function may be stored only through portions other than OSwhen OS is realized by cooperation of an assignment or OSand application.

[0049]It is also possible to superimpose a program on a subcarrier and to distribute via a communication network. For examplethis program may be put up for the bulletin board (BBS) of a communication networkand this may be distributed via a network. And above-mentioned processing can be performed by starting this program and making it perform like other application programs under control of OS.

[0050]
[Effect of the Invention]As explained aboveaccording to this inventionby the document issuing sidestick the characteristic information created about the feature section of documents on a documents pictureand by a documents receiving area. The existence of an alteration is verifiable by comparing the characteristic information created about the documents picture except the stuck characteristic informationand the stuck characteristic information. When exchanging especially documents in paper by using the characteristic information created about the feature section of documentsproper documents can be attested without being influenced by the dirt adhering to paperetc.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a system configuration figure of the documents authentication system concerning an embodiment of the invention.
[Drawing 2]When acquiring characteristic quantityit is a figure for explaining the standard coordinates set up to a document.
[Drawing 3]It is a figure for explaining the acquisition method of characteristic quantity concretely.
[Drawing 4]In the documents authentication system of drawing 1it is a figure for explaining the flow of processing until the published paper document receives attestation.

[Description of Notations]
1 Issuing device
11 Image input part
12 Inputted image accumulating part
13 Feature calculation part
14 Feature accumulating part
15 Characteristic quantity imaging part
16 Characteristic quantity image storage part
17 Outputted image generation part
18 Image output part
3 Authentication device
31 Image input part
32 Inputted image accumulating part
33 Characteristic quantity imaging range specific part
34 Characteristic quantity imaging range coordinates accumulating part
35 Original image restoration part
36 Original image storage part
37 Feature calculation part
38 Characteristic quantity accumulating part
39 Feature quantity image slicing part
40 Characteristic quantity image storage part
41 Original-feature-quantity regenerating section
42 Original-feature-quantity accumulating part
43 Difference judgment part
44 Difference decision-output part